

What is claimed is:

1. A polyol based resin blend comprising:

(a) from about 65 to about 99 percent by weight of a polyol component comprising:

(I) from about 20 to about 100 percent by weight of an aromatic polyester polyol reaction product formed by inter-esterification of:

(i) from about 10 to about 70 percent by weight of a phthalic acid based material;

(ii) from about 20 to about 60 percent by weight of a hydroxylated material having a functionality of at least 2; and

(iii) from about 1 to about 40 percent by weight of a hydrophobic material having:

(1) from one to six radicals, the radicals being selected from the group consisting of carboxylic acid groups, carboxylic acid ester groups, hydroxyl groups, and mixtures thereof;

(2) hydrocarbon groups totaling at least 4 carbon atoms for each radical present; and

(3) an average molecular weight of from about 100 to about 1000; wherein the hydrophobic material is substantially free of dimer acid; and

(II) from 0 to about 80 percent by weight of a polyether polyol; and

(b) a C₄-C₇ hydrocarbon blowing agent.

2. A blend according to claim 1, wherein the amount of the phthalic acid based material relative to the amount of the hydroxylated material is selected such that the aromatic polyester polyol (I) has a hydroxyl number of between 100 and 600.

5 3. A blend according to claim 1, wherein the amount of the hydrophobic material in the aromatic polyester polyol (I) is from about 5 to about 40 percent by weight, based on the total weight of the aromatic polyester polyol (I).

10 4. A blend according to claim 3, wherein the amount of the hydrophobic material in the aromatic polyester polyol (I) is from about 15 to about 40 percent by weight, based on the total weight of the aromatic polyester polyol (I).

15 5. A blend according to claim 3, wherein the amount of the phthalic acid based material relative to the amount of the hydroxylated material is selected such that the aromatic polyester polyol (I) has a hydroxyl number of between 100 and 600.

20 6. A blend according to claim 2, wherein the hydroxylated material is selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, dipropylene glycol, trimethylene glycol, butylene glycols, 1,2-cyclohexanediol, poly(oxyalkylene)polyols derived by the condensation of ethylene oxide, propylene oxide, or any combination thereof, glycerol, 1,1,1-trimethylolpropane, 1,1,1-trimethylolethane, 2,2-dimethyl-1,3-propane diol, pentaerythritol, and mixtures thereof.

7. A blend according to claim 6, wherein the hydrophobic material is selected from the group consisting of castor oil, coconut oil, corn oil, cottonseed oil, linseed oil, olive oil, palm oil, palm kernel oil, peanut oil, soybean oil, sunflower oil, tall oil, tallow, and mixtures thereof.

5 8. A blend according to claim 7, wherein the phthalic acid based material is selected from the group consisting of phthalic acid, isophthalic acid, terephthalic acid, methyl esters of phthalic, isophthalic, or terephthalic acid, phthalic anhydride, dimethyl terephthalate, polyethylene terephthalate, trimellitic anhydride, and mixtures thereof.

10 9. A blend according to claim 8, wherein the phthalic acid based material is phthalic anhydride and the hydroxylated material is diethylene glycol.

15 10. A blend according to claim 8, wherein the phthalic acid based material is phthalic anhydride and the hydroxylated material is a mixture of diethylene glycol and 1,1,1-trimethylolpropane.

11. A blend according to claim 9, wherein the hydrocarbon blowing agent is a pentane.

20 12. A blend according to claim 10, wherein the hydrocarbon blowing agent is a pentane.

13. A blend according to claim 1, wherein the polyol component further comprises one or more of a polyol selected from the group consisting of a thioether polyol, a polyester amide

containing hydroxyl groups, a polyacetal containing hydroxyl groups, an aliphatic polycarbonate containing hydroxyl groups, an amine terminated polyoxyalkylene polyether, a non-aromatic polyester polyol, a graft dispersion polyol, and a polyester polyether polyol.

- 5 14. A polyurethane or polyisocyanurate foam formed by reacting a polyisocyanate with the polyol based resin blend of claim 1.

Submit A 2 > 15. A method for preparing a rigid closed-cell polyisocyanate-based foam, comprising reacting a polyisocyanate and a polyol based resin blend, wherein the polyol based resin blend
10 comprises:

- (a) from about 65 to about 99 percent by weight of a polyol component comprising:
- (I) from about 20 to about 100 percent by weight of an aromatic polyester polyol reaction product formed by inter-esterification of:
- (i) from about 10 to about 70 percent by weight of a phthalic acid based material;
- (ii) from about 20 to about 60 percent by weight of a hydroxylated material having a functionality of at least 2; and
- (iii) from about 1 to about 40 percent by weight of a hydrophobic material having:
- (1) from one to six radicals, the radicals being selected from the group consisting of carboxylic acid groups, carboxylic acid ester groups, hydroxyl groups, and mixtures thereof;
- (2) hydrocarbon groups totaling at least 4 carbon atoms for each radical present; and

3) an average molecular weight of from about 100 to about 1000;
wherein the hydrophobic material is substantially free of dimer acid;
and

(II) from 0 to about 80 percent by weight of a polyether polyol; and

5 (b) a C₄-C₇ hydrocarbon blowing agent.

16. The method of claim 15, wherein the polyol component further comprises one or more of a polyol selected from the group consisting of a thioether polyol, a polyester amide containing hydroxyl groups, a polyacetal containing hydroxyl groups, an aliphatic polycarbonate containing hydroxyl groups, an amine terminated polyoxyalkylene polyether, a non-aromatic polyester polyol, a graft dispersion polyol, and a polyester polyether polyol.

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